

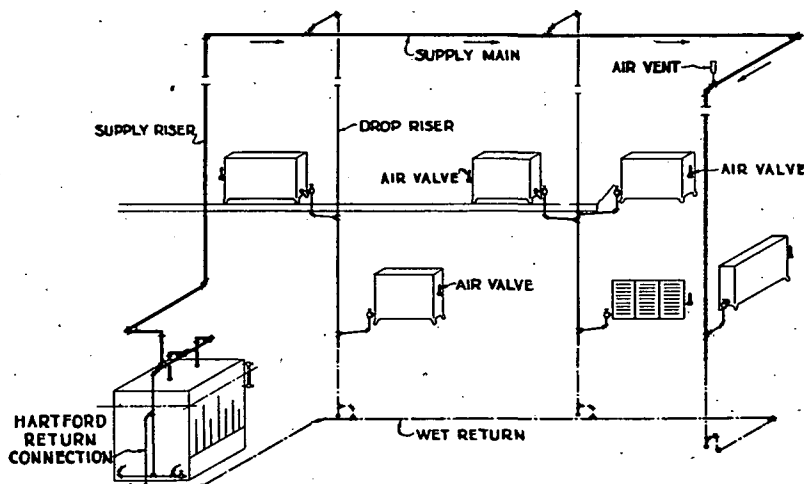


FIG. 2. TYPICAL GRAVITY DOWNFEED STEAM SYSTEM

Two-pipe Gravity Systems.—Two-pipe systems require separate supply and return pipes and a supply and return connection for each heating unit for steam and condensation. Like one-pipe systems, they require air valves on heating units and mains. The inlet supply connections may be either at the top or the bottom of the unit, but the outlet is always at the bottom so that all condensation will drain through this to the return

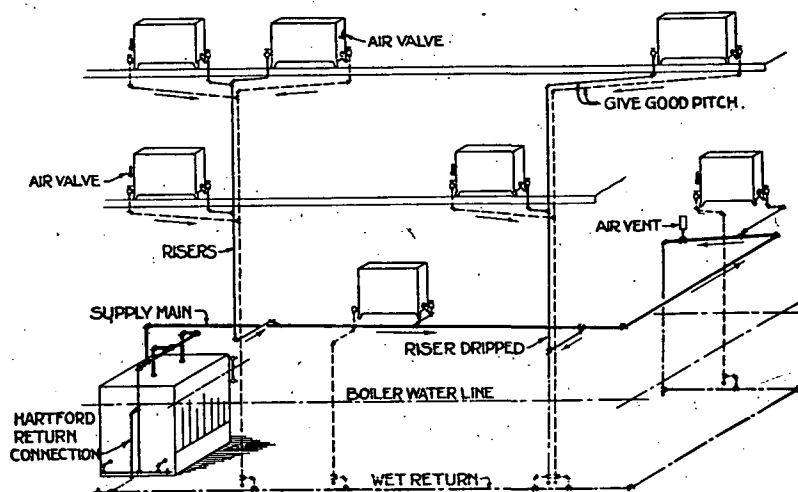


FIG. 3. TYPICAL GRAVITY TWO PIPE STEAM SYSTEM

mains, instead of back through the inlet connection to the supply mains, as with the one-pipe system. Both radiator connections should be valved.

The returns from heating units on several floors are usually connected into common risers and the various risers tie into the return system.

This return system, if kept above the water line so as to remain dry, is usually filled with steam (plus the water of condensation), at a pressure somewhere between that of the supply and that of the atmosphere, depending upon the amount of steam passing through the heating unit returns. This makes the gravity two-pipe system susceptible to the backing up of steam from one heating unit to another if return valve is left open, causing troubles due to water hammer, noise caused by counterflow and mixing of steam from the return with the condensation leaving the heating units and air binding due to the premature closing of air valves by

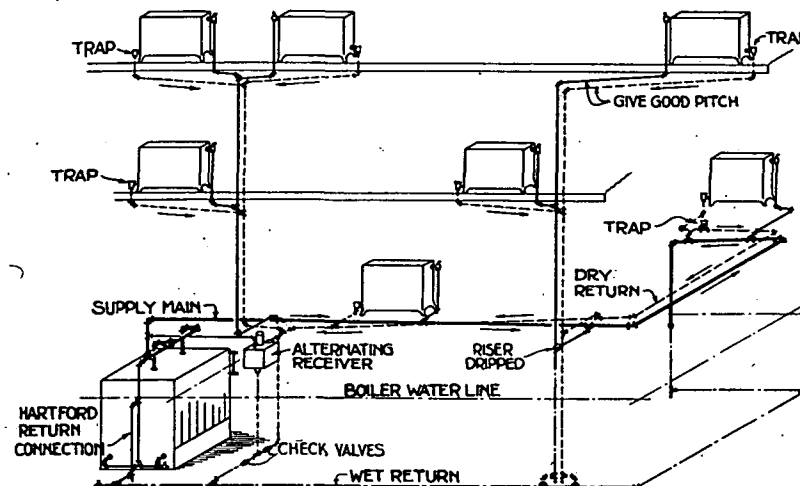


FIG. 4. TYPICAL GRAVITY VAPOR SYSTEM WITH RECEIVER

steam entering at the return end of the heating units. Sometimes check valves are used on the return end of heating units to prevent steam backing into those which have been shut off. This practice is not desirable as condensation may collect in the heating units, endangering the boiler. The troubles from the backing up of steam in the returns are generally eliminated when all heating unit returns are connected separately into the wet return. The return mains are kept below the water line, so as to be wet.

The use of vacuum air valves and automatic temperature control on two-pipe systems with wet returns is not recommended.

Vapor Systems.—Generally vapor systems are specially designed two-pipe systems, operated at a very low pressure. They differ from the gravity two-pipe systems in four important particulars: (1) that the steam is prevented from entering and building up pressure in the return